AREA-SPECIFIC LOCKOUT/TAGOUT PROCEDURES

Course 1737
Jun 03

HAFB Lockout/Tagout Program

- Driven by Occupational Safety and Health Administration (OSHA) and Air Force Occupational Safety and Health (AFOSH) standards.

- Described in Hill AFB Instruction 91-302, *Control of Hazardous Energy (Lockout/Tagout).*

What is Lockout/Tagout?

- Lockout/Tagout is referred to as LOTO.
- LOTO uses **lockout devices** to block the flow of energy from the power source(s) to the machine.
- LOTO uses **tagout devices** to provide a means of warning to employees.

Scope of the LOTO Program

- The LOTO Program covers the servicing, maintenance, and repair of machines in which the **UNEXPECTED** energization or start-up of the machines, or the release of stored energy, could cause injury to employees.

Purpose of the LOTO Program

- Purpose of the LOTO Program is to establish standard procedures to control hazardous energy during machin servicing, mainte and repair **in prevent inju employees**.

Key Elements of the HAFB LOTO Program

- Identify machines that require LOTO procedures.
- Write accurate LOTO procedures for machines that require them.
- Provide individuals who are authorized to perform LOTO procedures with proper training.

Key Elements of the HAFB LOTO Program (Cont.)

- Provide awareness training to individuals who are not part of the LOTO process.
- Have the appropriate LOTO devices and ensure proper use of such equipment in the lockout/tagout process.
- Perform inspections to ensure elements of the program are being followed.

LOTO is IMPORTANT to YOU!

- 59% of all accidents caused by a release of energy during maintenance procedures resulted in **DEATH**.

- 12% of all lockout-related injuries resulted in **AMPUTATION** of some part of the body.

How does Unexpected Release of Energy Cause Accidents?

- Accidents can happen anytime you place any part of your body within range of machine parts that move.
  - Cut
  - Strike
  - Crush
  - Entangle
  - Push
  - Clamp

Unexpected mechanical action can CUT you.

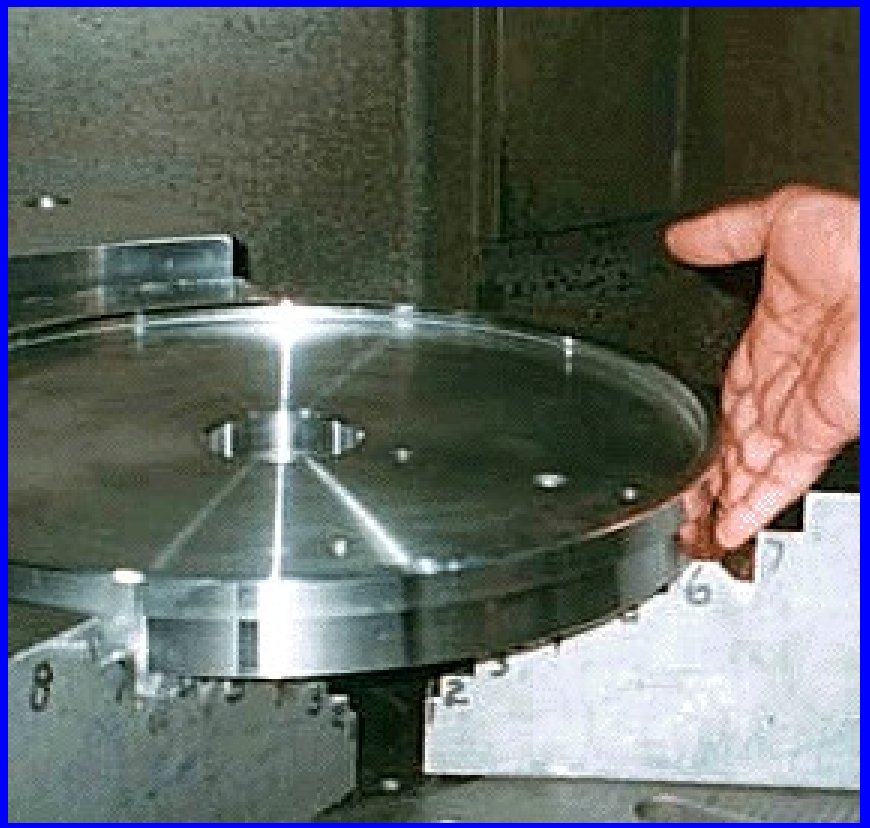
For example, if a saw suddenly starts up, it could cut off a limb.

Unexpected mechanical action can STRIKE you.

For example, fly wheels or moveable machine parts that haven't stopped moving, or start moving by accident, can strike you.

Unexpected mechanical action can CRUSH you.

For example, you could be caught in a rolling mill or calendar that suddenly starts up when you are in the way.

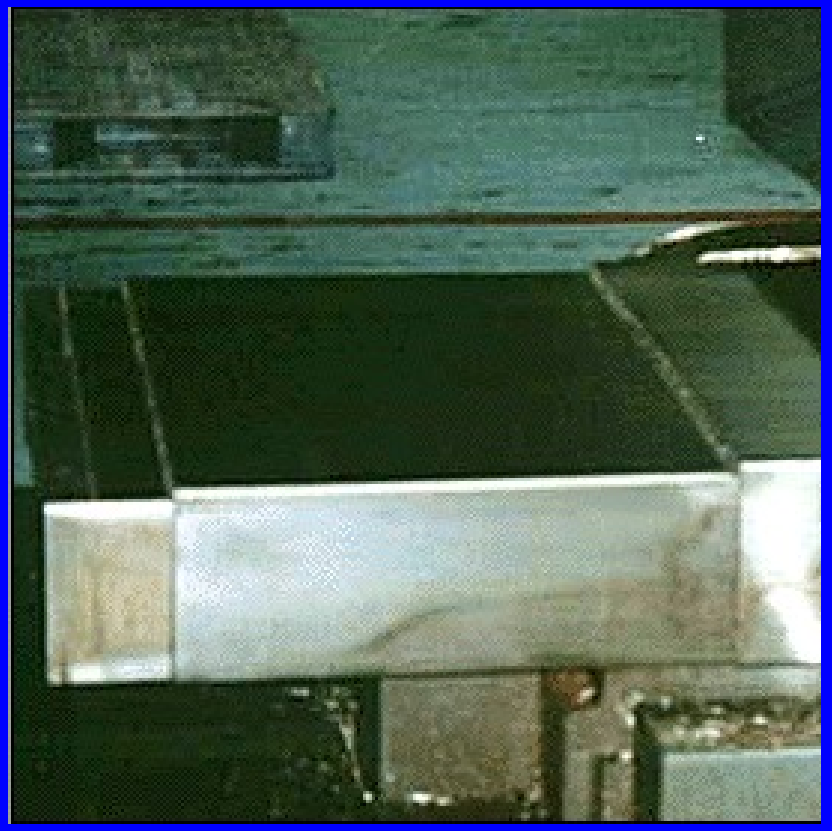


Unexpected mechanical action can ENTANGLE you.

For example, a conveyor belt or pulley that starts unexpectedly could entangle your clothes and drag you along.

Unexpected mechanical action can PUSH you away with great force.

For example, a machine part that is not secured could move suddenly and push you away with harmful force.



Unexpected mechanical action can CLAMP down on you.

For example, a drop forging hammer that is not blocked could clamp down on your hand and cause injury.

LOTO Applies to Everyone

- There are 3 categories of employees covered by the LOTO Program:
  - Authorized Employees
  - Affected Employees
  - Other Employees

Authorized LOTO Employee

- A person (such as an operator or maintenance technician) who locks/tags out a machine in order to perform servicing, maintenance, or repair on that machine.

- A person (such as a supervisor) who coordinates lockout/tagout procedures.

Typical Duties of LOTO Authorized Employees

- Authorized employees:
  - Construct / install,
  - Set up / calibrate,
  - Troubleshoot / inspect,
  - Clean / lubricate,
  - Adjust / change tooling,
  - Repair / modify, or
  - Supervise such activities

Affected LOTO Employee

- An employee whose job requires him/her to operate or use a machine which is covered by the LOTO Program.

- An employee whose job requires him/her to to work in an area in which machine servicing, maintenance, or repair takes place using lockout/tagout procedures.

Affected vs. Authorized

- An affected employee (such as an operator) becomes an authorized employee when **AT ANY TIME** his/her duties include performing service, maintenance, or repair tasks on a machine covered by the LOTO Program.

Other Employees

- Persons (such as non-resident employees, visitors, etc.) who may pass through an area where LOTO procedures take place.

- Employees who do not fit into the LOTO “Affected” or “Authorized” categories.

Surveying Machines for the LOTO Program

- Supervisors must survey the machines in their area at least annually to determine which require formal LOTO procedures.

- They document their evaluations on OO-ALC Form 530, *Equipment Survey for Lockout/Tagout Procedures*.

Sample OO-ALC Form 530

EQUIPMENT SURVERY FOR LOCKOUT/TAGOUT PROCEDURES

1. ORGANIZATION			2. DATE			
BUILDING NUMBER	EQUIPMENT NAME	PREVENTATIVE MAINTENANCE/ IDENTIFICATION NUMBER	LOCKOUT PROCEDURES REQUIRED		DATE	COMMENTS
			YES	NO		

CO-ALC FORM 530, MAY 01 (EF-V7) (FormFlow)

Determining Which Machines Require LOTO Procedures

- When determining which machines require formal LOTO energy control procedures, supervisors must identify:
  - Applicable hazardous energy sources,
  - Type and magnitude of the energy available in the workplace, and
  - Methods and means necessary for energy isolation and control.

Types of Energy

- Today's complex machines may be powered by several types of energy:
  - Electrical
  - Pneumatic
  - Air
  - Hydraulic
  - Gas
  - Spring
  - Gravity
  - Steam
  - Mechanical
  - Pressure

Machines that Require LOTO

- Those with potential for stored or residual energy (or re-accumulation of stored energy) after shutdown.
- Those with a single energy source that cannot be easily identified and isolated.
- Those with multiple energy sources.

Machines that Require LOTO (Cont.)

- Those where isolation and locking out of the energy source will not completely de-energize the machine.
- Those where the energy source is not isolated and locked out during service, maintenance, or repair.
- A machine where the employer utilizing it had a LOTO-related accident.

Machines that Require LOTO (Cont.)

- Those where a single lockout device will not achieve a locked-out condition.
- Those where a lockout device is not under the exclusive control of the authorized employee performing the work.
- Those where service, maintenance or repair creates hazards for other employees.

Machines that DO NOT Require Formal LOTO Procedures

- Machines with cord and plug connections for which exposure to the hazards of unexpected energization or start up of the machine is controlled by:
  - the unplugging of the equipment from the energy source, and
  - the plug being under the exclusive control of the employee performing the service, maintenance, or repair.

Cord and Plug Machines

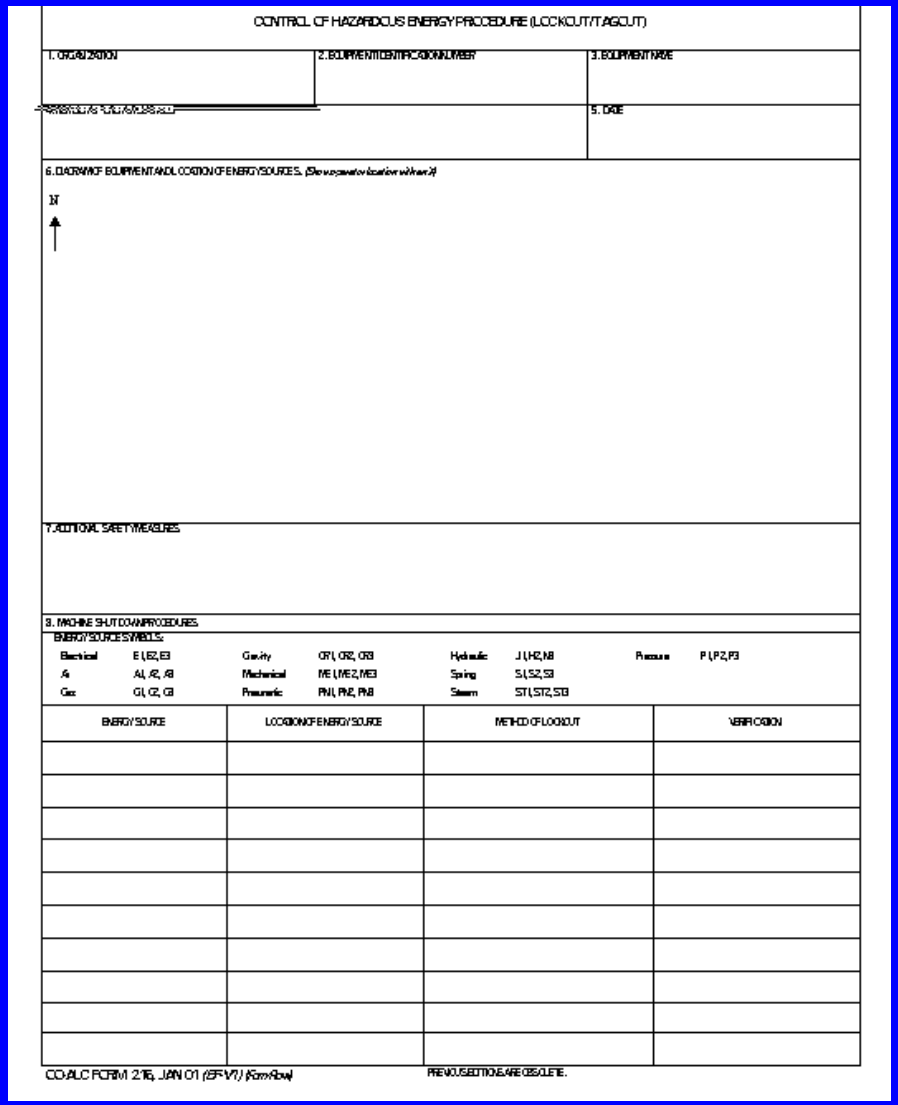
- Even cord and plug machines require safety precautions for service, maintenance, and repair.
- Those working on machines that do not require formal documented LOTO procedures are still wise to use lockout de prevent acci plug

Writing a LOTO Energy Control Procedure

- OO-ALC Form 215, *Control of Hazardous Energy Procedure (Lockout/Tagout)* is used to document the specific LOTO procedures for an applicable machine.

- Form 215 shows as clearly as possible where the energy sources are, how to lock them out, and how to verify that they are locked out.

Sample OO-ALC Form 215



CONTROL OF HAZARDOUS ENERGY PROCEDURE (LOCKOUT/TAGOUT)

1. ORGANIZATION	2. EQUIPMENT IDENTIFICATION NUMBER	3. EQUIPMENT NAME

4. AUTHORIZATION (SUPERVISOR'S SIGNATURE)

5. DATE

6. DIAGRAM OF EQUIPMENT AND LOCATION OF ENERGY SOURCES. *(Show geometric location where it)*

N

7. ADDITIONAL SAFETY MEASURES

8. MACHINE SHUT DOWN PROCEDURES

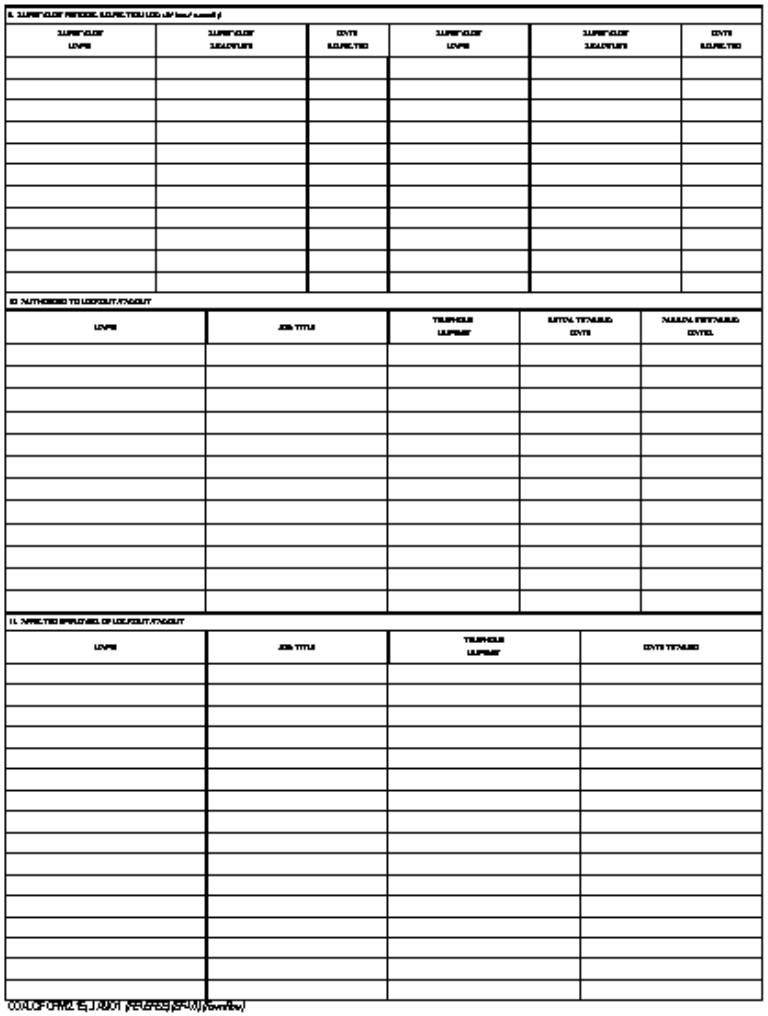
ENERGY SOURCE SYMBOLS:

Electrical	E (E2, E3	Gravity	GR (GR2, GR3	Hydraulic	J (JH2, JN3	Pressure	P (P2, P3
Air	A (A2, A3	Mechanical	ME (ME2, ME3	Spring	S (S2, S3		
Gas	G (G2, G3	Pneumatic	PN (PN2, PN3	Steam	ST (ST2, ST3		

ENERGY SOURCE	LOCATION OF ENERGY SOURCE	METHOD OF LOCKOUT	VERIFICATION

CO-ALC FORM 215, JAN 01 *(EF-V1)* *(Formflow)*

PREVIOUS EDITION ARE OBSOLETE.



9. AUTHORIZED TO LOCKOUT/TAGOUT

USER	JOB TITLE	TELEPHONE (DSN/COM)	INITIAL TIME/DATE (DDTB)	NAME/INITIAL TIME/DATE (DDTB)

11. NAME(S) EMPLOYEE(S) OF LOCKOUT/TAGOUT

USER	JOB TITLE	TELEPHONE (DSN/COM)	DDTB TIME/DATE

CO-ALC FORM 215, JAN 01 *(EF-V1)* *(Formflow)*

HAFB Yellow Caution Label

- Machines that require an energy control procedure should have Hill Visual Aid 91-202 applied near the control switch.

What is an Energy-Isolating Device?

- An energy-isolating device is a mechanical device that physically prevents the transmission or release of energy, such as:
  - A manually operated electrical circuit breaker,
  - A disconnect switch,
  - A block,
  - A line valve, etc.

Energy-Isolating Device Examples

What is a Lockout Device?

- A device such as a keyed padlock that physically holds an energy-isolating device in a safe position and prevents the energizing of the machine.

U.S.
Lock out/ tag out
Procedures
1. Notify Supervisor of the problem.
2. Call Maitenance trouble desk
3. Remove lock from cabinet
4. Place your name tag in it's place
5. Fill out --- lock out tag
6. After equipment is operational remove tag
And replace lock in cabinet.

HAFB Authorized Lock Criteria

- Key-type padlock
- Durable
- Substantial
- Used solely for LOTO
- Identifiable
- Body at least ½ **RED**
- Only 1 key

HAFB Authorized Multiple Lockout Device Criteria

- Lockout switch (hasp, tong) or equivalent is used when an energy- isolating device cannot accept the necessary number of individual locks.

When a Machine Cannot be Locked Out

- The lockout process is used whenever possible.
- If an energy-isolating device is not capable of being locked out, **a special energy control procedure is set up that includes tagout devices and additional safety measures to fully protect the employee.**

What is a Tagout Device?

- A prominent warning device (such as a tag) that alerts employees not to operate the energy- isolating device and the machine being controlled.

When are Tagout Devices Used?

- Tagout devices are used as a last resort when there is no way a machine can be locked out.

- Tagout devices are not to be used or justified because someone failed to get the proper lockout devices.

Attaching Tagout Devices to Machines

- Tagout devices are attached at the same point as the lockout device would be placed, or as close as safely possible to the energy-isolating device .

- Tagout Devices are secured with a self-locking, non-releasable, nylon wire tie.

Use of Tags with Locks

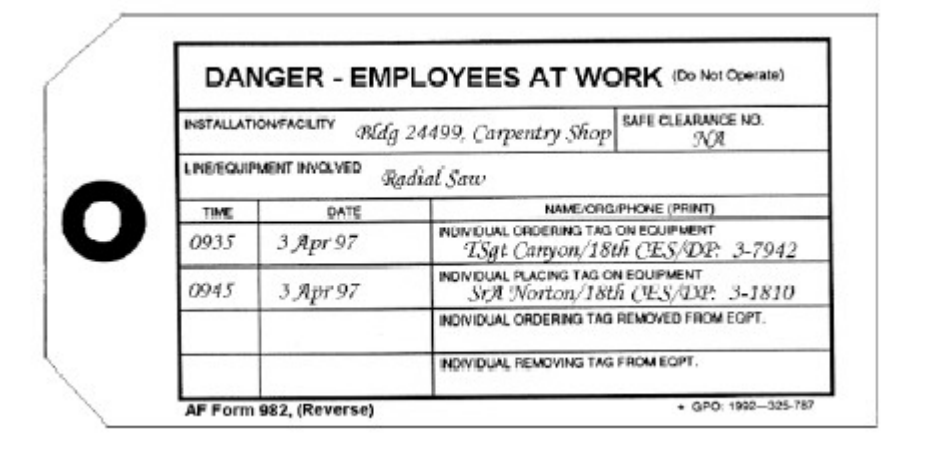
- At HAFB, tags are used side by side with locks.
- They are attached to the energy isolating device along with the lock to warn employees of potential hazards.

HAFB Authorized Tag Criteria

- Durable
- Substantial
- Identifiable
- Appropriate

AF Form 979, *Danger Tag*

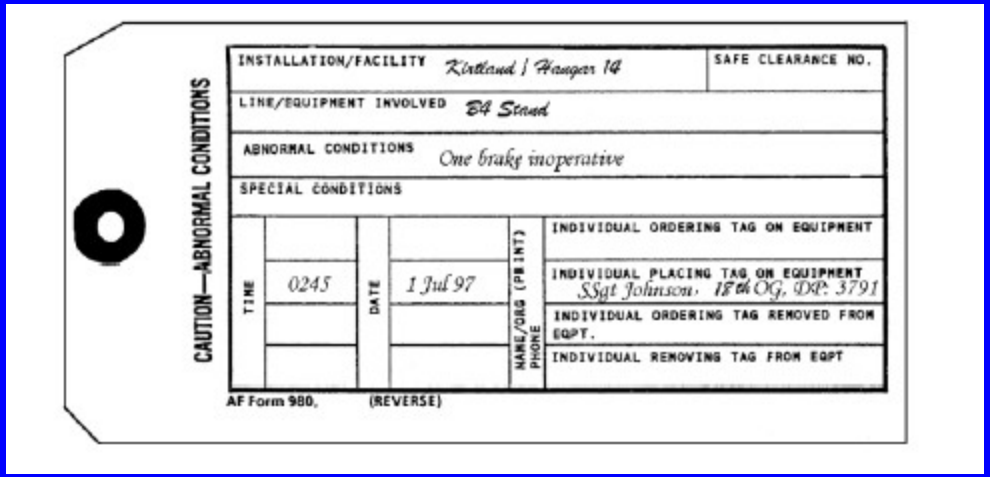
- Used to identify immediate danger situations.



AF Form 980, *Caution Tag*

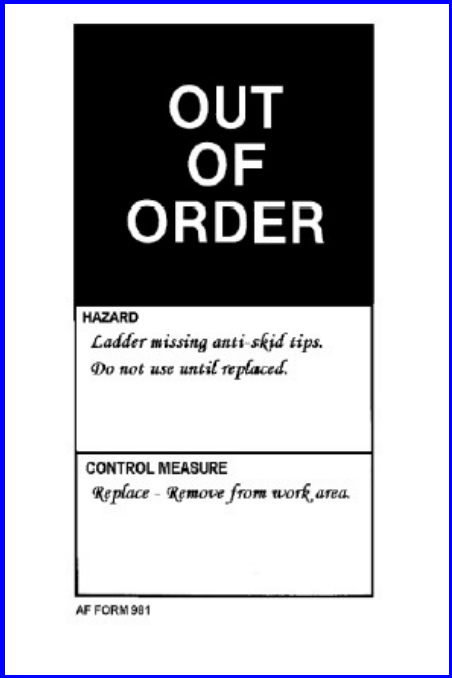
- Least used – warns of potential hazard.

CAUTION
HAZARD
B4 Stand has one inoperative brake.
CONTROL MEASURE
Tagged. Use only in hangar. Do not use on flightline until brake is repaired.
AF Form 980



AF Form 981, *Out of Order Tag*

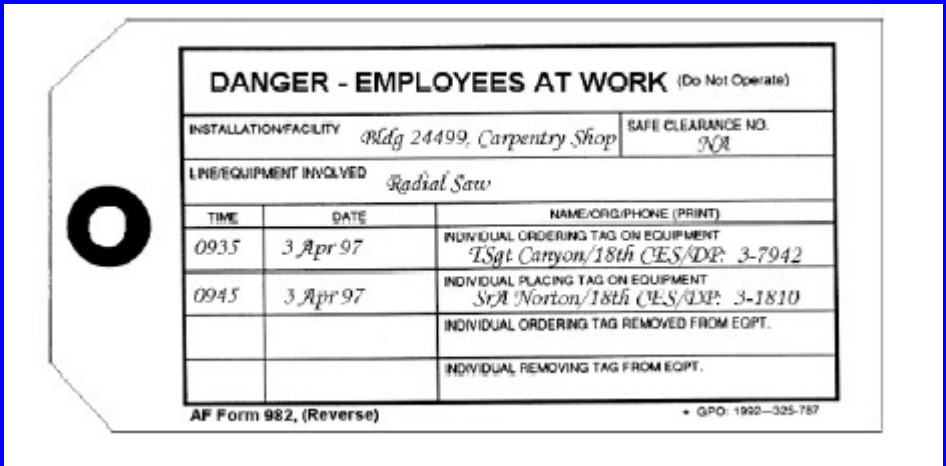
- Used to indicate a machine is out of order and its use might present a hazard.



HAZARD IDENTIFICATION/NOTICE OF HAZARD
ITEMS 1 THRU 4 TO BE COMPLETED BY INDIVIDUAL PLACING TAG
(Last entry in these items is individual currently responsible for tag)
1. TIME
2. DATE
3. SHOP OR OFC SYMBOL
4. PRINTED GRADE, NAME AND PHONE NO.
ITEMS 5 THRU 7 MUST BE COMPLETED BY RESPONSIBLE SUPERVISOR
(Prior to completing these items, the supervisor must coordinate with the responsible functional manager to ensure annotation of AF Form 3, USAF Hazard Abatement Log. See AFI 91-301
5. RISK ASSESSMENT CATEGORY
6. VERIFICATION DATE
7. FUNCTIONAL MGR NO.
DO NOT REMOVE UNTIL HAZARD IS ABATED/CORRECTED

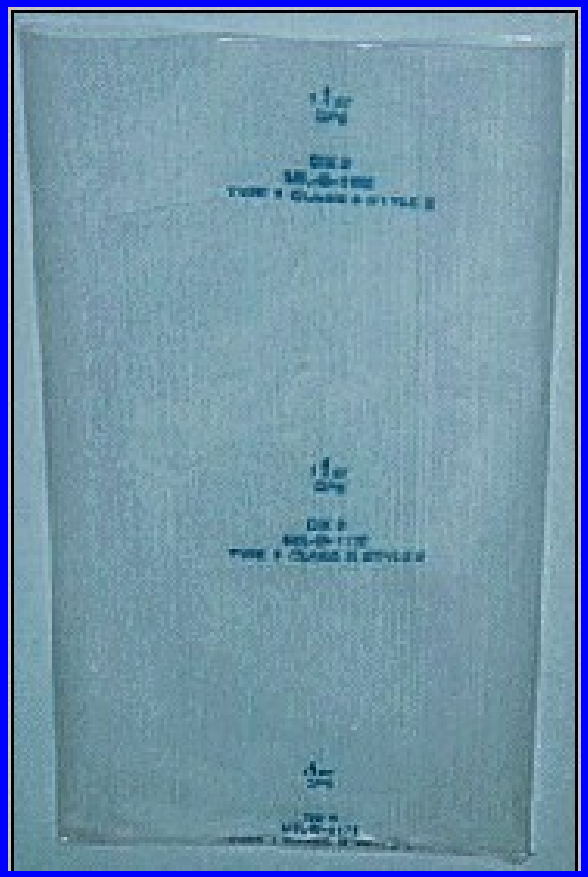
AF Form 982, *Do Not Start Tag*

- Used to warn personnel of a potential hazard if equipment is restarted.



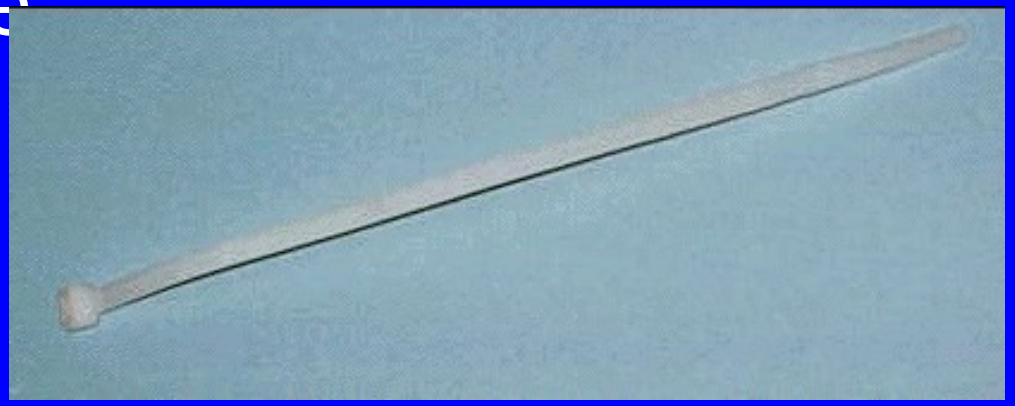
Plastic Tag Envelope

- The tag is placed in a plastic envelope when the physical environment may affect the tag.



Nylon Wire Tie

- The plastic tag strap is self-locking, non-releasable and attaches with a minimum unlocking strength of 50 lbs or more



General LOTO Procedures

1. Prepare for shutdown.
2. Shutdown machine.
3. Locate and isolate all energy sources.
4. Affix lockout/tagout devices.
5. Release all stored energy.
6. Verify that machine will not operate.

1. Prepare for Shutdown

- Review the Form 215 attached to the machine to verify:
  - Type and magnitude of energy involved,
  - Hazards of the energy to be controlled, and
  - Method or means to control the energy.

- Obtain appropriate lockout/tagout devices.

1. Prepare for Shutdown (Cont.)

- Locate and identify each energy-isolating device.
- Notify all affected employees that a lockout/tagout system is going to be utilized and explain why.
- Remind employees not to attempt to start the machine or power source and to leave locks and tags alone.

2. Shutdown Machine

- Use normal established procedures to turn off or shut down the machine.

- An orderly shutdown prevents any additional or increased hazards to employees as a result of machine stoppage.

3. Locate and Isolate All Energy Sources

- Follow the Form 215 to ensure that all identified energy sources are located and isolated.
- Install the appropriate energy-isolating devices so the machine is isolated from all of its incoming energy sources.

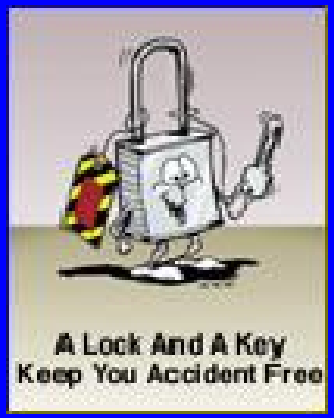
4. Release All Stored Energy

- It is not enough to just stop the incoming energy sources to the machine.

- You must also neutralize any stored energy in machine parts that could set equipment into unexpected motion.

5. Affix Lockout/Tagout Devices

- Affix your individual lock so that it will hold the energy-isolating devices in a “safe” or “off” position.



- Attach your tag directly to the energy-isolating device, or as close as safely possible, so that it is immediately obvious to anyone attempting to operate the device.

6. Verify That the Machine Will Not Operate

- Prior to starting work on the machine, perform a test by pushing the buttons, switches or other normal operating controls to make certain the equipment will not operate.

- Remember to return operating controls to “neutral” or “off” position after the test!

General Procedures for Restoration of Power

1. Before restarting a machine, double check everything.
2. Remove lockout/tagout devices.
3. Notify employees.
4. Restore energy to the machine.
5. Test and verify that machine operates properly.

1. Before Restarting a Machine, Double Check Everything

- Tools
  - Have any been left behind in the machine?
- Machine
  - Are all parts re-assembled, in operating condition, properly lubricated, adjusted, and set up?
- Guards
  - Are they all in place?

1. Before Restarting a Machine, Double Check Everything (Cont.)

- Braces, pins, blocks, chains
  - Have they all been removed?
- Pressure tubing, pipe, hoses
  - Are they all connected, with valves closed?
- Work Area
  - Is it clear for proper mechanical operation?

1. Before Restarting a Machine, Double Check Everything (Cont.)

- Personnel
  - Are you certain that all workers have left the danger zone?
- Personal Protective Equipment
  - Is everyone wearing his/her required gear for normal operation?

2. Remove LOTO Devices

- Each lockout and tagout device is removed from energy-isolating devices by the authorized employee who affixed the device.

- Special procedures exist for situations (shift changes, absent employees) where the employee who affixed the device is not able to remove it.

3. Notify Employees

- Notify the supervisor and all affected employees that LOTO devices have been removed and restoration of energy to the machine is about to begin.

4. Restore Energy to the Machine

- Be alert for all possible movements that may occur as power is returned to the machine and movable parts are unblocked – even if the equipment is turned off.

- Operate the energy-isolating devices to restore energy to the machine.

5. Test and Verify That Machine Operates Properly

- After removing LOTO devices and restoring energy to the machine, perform a test by pushing the buttons, switches or other normal operating controls to make certain the equipment is operating properly.

Procedures for LOTO Involving More than One Person

- When more than one person is required for LOTO of a machine, each places his/her personal lock/tag on the energy-isolating device.

- Each removes his/her own lock/tag when protection is no longer needed.

Procedures for Group LOTO

- Group LOTO device must provide equal protection as a personal lock/tag.
- One employee is assigned overall LOTO responsibility for the group.
- Each employee must affix and later remove his/her own personal lock/tag to the group LOTO device.

Procedures for Shift Change

- During a shift or personnel change there must be an orderly transfer of LOTO control to ensure employee protection.
- Incoming supervisors lock-on before outgoing supervisors lock-off.
- Outgoing and incoming supervisors coordinate the transfer of locks.

Removal of LOTO Devices by Another Authorized Employee

- Before removing the LOTO device, the supervisor verifies that the employee who put on the device cannot be located.

- The supervisor informs the employee that his/her LOTO device has been removed before he/she resumes work at the site.

Procedures for Contractors

- Contractors are responsible for their own LOTO Program and LOTO training.

- HAFB supervisors and the contractor representatives must inform each other of their respective LOTO procedures to ensure the safety of all personnel.

Periodic LOTO Inspections

- Qualified safety inspectors conduct inspections of the LOTO Program at least annually to ensure compliance.

- Supervisors are require to conduct self-inspections of their elements of the LOTO Program no later than 15 October each year.

Review Area-Specific Form 215s

- It is now time to review the specific Form 215 for each of the applicable machines in your area.

- To protect yourself and others from injury – even death – you must fully understand the energy control procedures described on each of your Form 215s.

Inventory Lockout/Tagout Devices

- While reviewing the Form 215 procedures, verify that all energy isolating devices, locks and tags called for are available and ready for use.

- If a device called for on a Form 215 is not available, order it! Your life may depend on it.

Additional LOTO Information

- The OO-ALC/SE homepage has the most current information on LOTO:
  - Regulations, policies and guidance.
  - Employee and supervisor responsibilities.
  - Training materials.
  - Sample forms and checklists.

- http://www.hill.af.mil/safety/lockframe.htm